Appendix E

# *Project Level Toll Analysis and Effects on Environmental Justice Populations*

Technical Report

# 1.1 BACKGROUND AND METHODOLOGY

## 1.1.1 Project Background

The US 281 Environment Impact Statement (EIS) evaluates the impacts of improvements to the US 281 corridor between Loop 1604 and the Bexar County Line near Borgfeld Drive. The corridor is approximately eight miles long and is currently a four lane highway with at-grade intersections along its length.

Several build alternatives were developed for consideration in the EIS, including some that contain a toll component. According to Federal Highway Administration (FHWA) and Texas Department of Transportation (TxDOT) joint guidance[1], proposed toll facilities must undergo an evaluation to determine anticipated effects on Environmental Justice (EJ) populations within the region, including the impacts to travel time and/or out-of-pocket cost.

No tolled or managed roadways are currently operational in the region, but the San Antonio-Bexar County Metropolitan Planning Organization (SA-BC MPO) has identified several corridors as planned toll and/or managed facilities by the year 2035, including the northern half of Loop 1604, I-35 east of downtown, I-10 north of Loop 1604, and the US 281 Project Corridor – US 281 north of Loop 1604. These planned facilities are generally situated away from the concentrated Environmental Justice zones.

## 1.1.2 Policy Guidelines

This analysis is based on the Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System (April 2012).

The toll policy exempts emergency vehicles and military vehicles from paying tolls on the Alamo RMA toll road system. The policy also exempts public transportation vehicles from paying tolls when using the managed lanes operated by the Alamo RMA. Exemptions shall be established on an annual basis between the transit agency and Alamo RMA for use of traditional toll facilities without the managed lane designation by public transportation vehicles. The toll policy exempts registered car pool vehicles only when using the managed lane facility.

The Alamo RMA will utilize an all-electronic toll collection system without requiring vehicles to stop at toll plazas. Toll tags will be available for users and those without toll tags will be able to elect for video tolling. Such users will see an additional amount, no less than 33% but no more than 50% of the total fees added to cover the processing costs for each video transaction in addition to a $1.00 handling fee.

The policy provides for equal access to the Alamo RMA system and agency. The primary website will be in English and Spanish, as well as other languages offered via online based translation programs. Customer service will be provided in the predominant language(s) in the region served by the Alamo RMA. Further details regarding the Alamo RMA toll policy are available on its website at: http://www.alamorma.org/default/assets/File/PDF/Policies/Alamo%20RMA%20Toll%20Policies%20October%202007.pdf

[1] *Federal Highway Administration and Texas Department of Transportation Joint Guidance for Project and Network Level Environmental Justice, Regional Network Land Use, and Air Quality Analyses for Toll Roads*, April 23, 2009.

### 1.1.3 Environmental Justice Data

The San Antonio region has a large Environmental Justice – minority and/or low-income – population. The *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System* (April 2012) and the FHWA/TxDOT guidance recommend a threshold of 50% to identify areas with Environmental Justice populations. The analysis presented herein is consistent with the 50% recommendation. A Traffic Analysis Zone (TAZ) with an Environmental Justice population percentage greater than or equal to 50 percent is identified as an Environmental Justice zone.

There are 638 such zones in the San Antonio region out of a total of 1,136, and these Environmental Justice zones are projected to contain 1.41 million residents by the year 2035, out of a total regional population of about 3.94 million. The zones identified as having 50 percent or more minority and low-income population are mostly concentrated in the southern part of the region. Fig1 displays the planned toll/managed facilities in the region and the identified Environmental Justice TAZ's for year 2008.

### 1.1.4 Description of Proposed Toll Facility

Several roadway alternatives were proposed for the US 281 Corridor Project. The alternatives development and screening process described in the Draft EIS resulted in the selection of two Proposed Build Alternatives for inclusion in the Draft EIS, both of which have variations that include non-toll, toll, or managed lanes. In addition to the Proposed Build Alternatives, the No-Build Alternative was evaluated. The Environmental Justice analysis presented herein focuses on the comparison of the No-Build Alternative with the Expressway Alternative -Non-Toll and Toll, as this Proposed Build Alternative accommodates the greatest number of trips through the corridor. These alternatives are discussed in the next sections.

#### No-Build Alternative

The No-Build Alternative is defined for the US 281 EIS as the existing roadway facility, together with committed improvement projects as planned by the MPO outside of the specific action being proposed. The 2035 network provided by the MPO was used as the base for the No-Build network. This 2035 network includes widening and upgrading US 281 to a tolled expressway in the study area. For this project analysis, this improvement was removed from the model network and US 281 was recoded to conditions as in the 2008 model to form the No-Build network including the superstreet configuration.

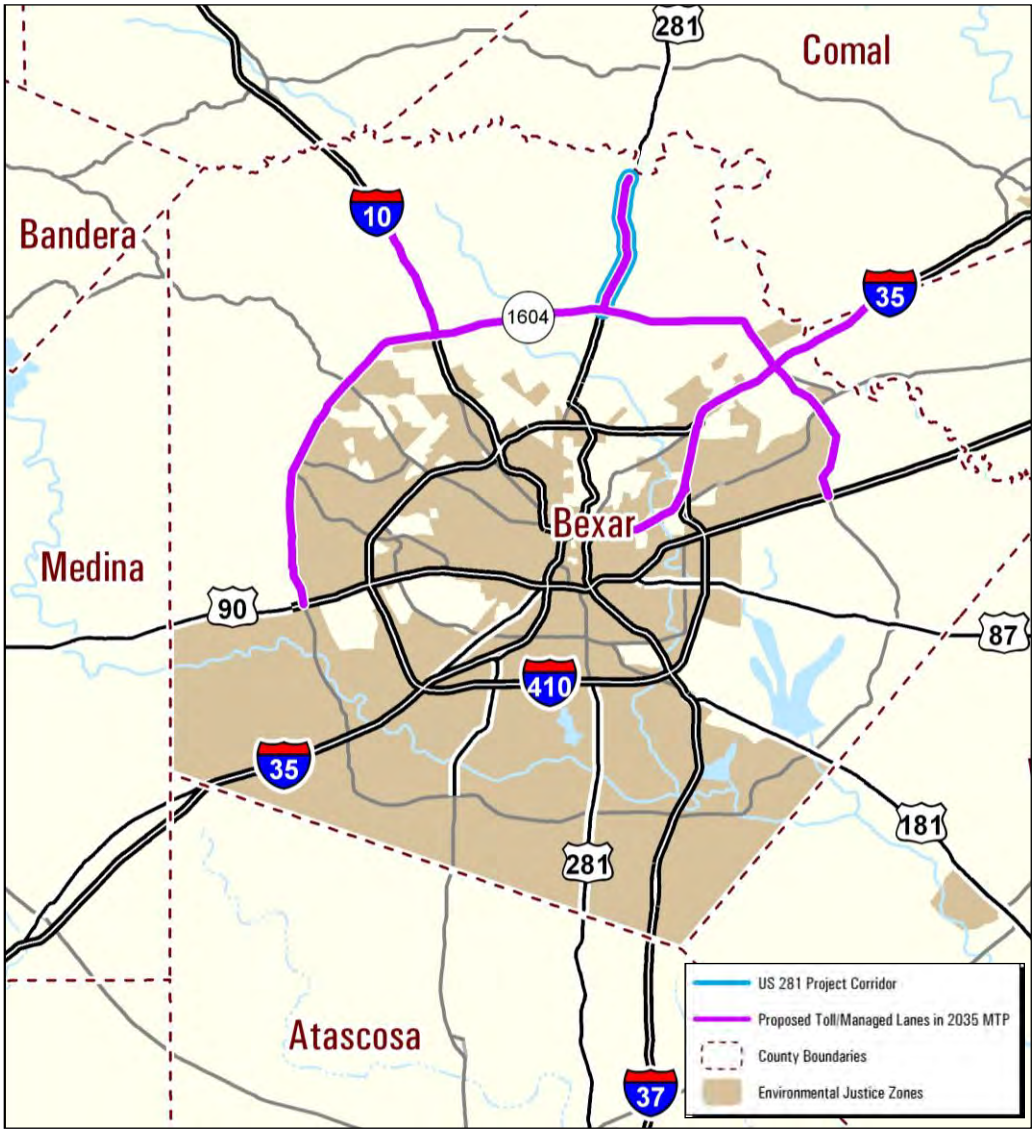
#### Expressway Alternative

Three options for the Expressway Alternative were considered: A) Non-Tolled Mainlanes, B) Tolled Mainlanes, and C) Managed (Toll and High Occupancy Vehicle (HOV)) Mainlanes.

#### Expressway Alternative – Non-Toll

The General Purpose option was found to attract the greatest demand for US 281 trips and includes three expressway through lanes plus one auxiliary lane in each direction through the corridor.

Figure E-1: Proposed Toll Facilities and Environmental Justice Zones




Source: US 281 EIS Team, 2011

## Expressway Alternative – Toll

The Expressway Alternative - Toll is the same configuration as the Expressway Alternative – Non-Toll, but the expressway is designated as a toll facility. The toll policy for this corridor – including potential accommodations for minority, disabled, or low-income populations – would follow the guidelines outlined in the *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System* (April 2012). The toll guidelines would include policies regarding outreach to minority and disabled communities to allow full access to the toll facility, including websites in Spanish and a customer service number for the hearing disabled population. Toll collection would be conducted with electronic transponders or similar technology. Policies regarding purchases of toll tags by low-income populations are not planned or adopted yet, but would follow guidelines specified in the *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System* (April 2012). For preliminary analysis, toll gantries might be constructed at the following locations:

1. South of Borgfeld
2. South of Wilderness Oaks
3. South of Stone Oak
4. South of Encino

### 1.1.5 Alternate Routes

In the study area, alternate routes would be available to those unable or unwilling to use the toll facility. First, a frontage road system would be constructed directly adjacent to the toll facility. This system would include a minimum of two one-way lanes for both directions of travel and would provide local access along the corridor as well as access to and from the tollway. In addition to the frontage roads, two primary alternate routes exist in the vicinity of the project: Bulverde Road to the east and Blanco Road to the west. Each of these facilities is planned to be at least two lanes in each direction, and would operate as principal arterials in most of the study area. These alternate routes are displayed in **Figure E-2**. In addition to these alternate routes, the local street network, including roads like Stone Oak and Canyon Golf, could be utilized.

### 1.1.6 Travel Demand Model

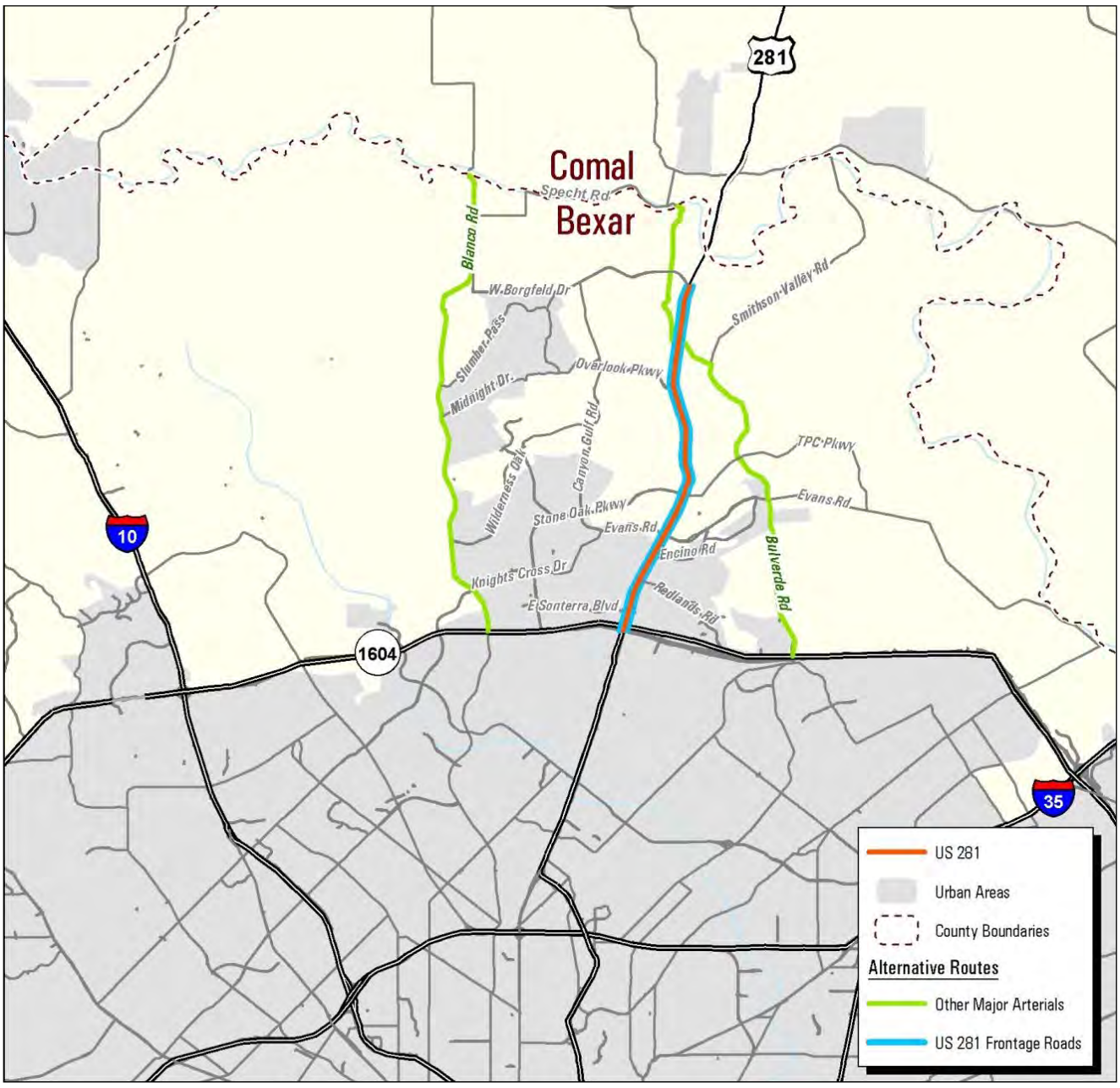
For the identification of potential trips using the corridor and the analysis of the travel time impacts on those trips, the SA-BC MPO Regional Travel Demand Model was utilized. The travel model provides travel demand volume projections at a daily level. It also produces estimates of trip origins and destinations, as well as congested roadway travel times. The SA-BC model uses input parameters including speed and travel time based on observed congested – peak hour – conditions. The model assigns trips to roadways under these peak conditions, and reports forecasted peak hour speeds and volume-to-capacity (v/c) ratios, and daily traffic volumes.

As with any simulation model, there are limitations to its capabilities. The model has a basic procedure for estimating toll road volume, which is traffic assignment based. The toll procedure adds a cost in terms of travel time by converting an assumed toll rate per mile with value-of-time assumptions, for links coded as toll links.

For a complete summary of the application of the travel demand model for the US 281 EIS, see **Appendix D** – Application of SA-BC MPO Travel Demand Model.

The model was used to determine "candidate" trips for the corridor – these are trips that would use the proposed facility because it would provide the fastest route. These candidate trips were determined by isolating the corridor and identifying trip origin and destination pairs (TAZ's) that use any segment along the corridor. The candidate trips were selected using the "free" build alternative because it attracts the most travelers on the corridor – it provides increased roadway capacity at no additional cost to the traveler.

Figure E-2: Alternate Routes




Source: US 281 EIS Team, 2011

Subsequently, each candidate trip origin-destination (O-D) pair was analyzed to determine the travel time between those TAZ's. This process calculates the congested travel time along the best (shortest time) possible route, and was conducted for the following scenarios:

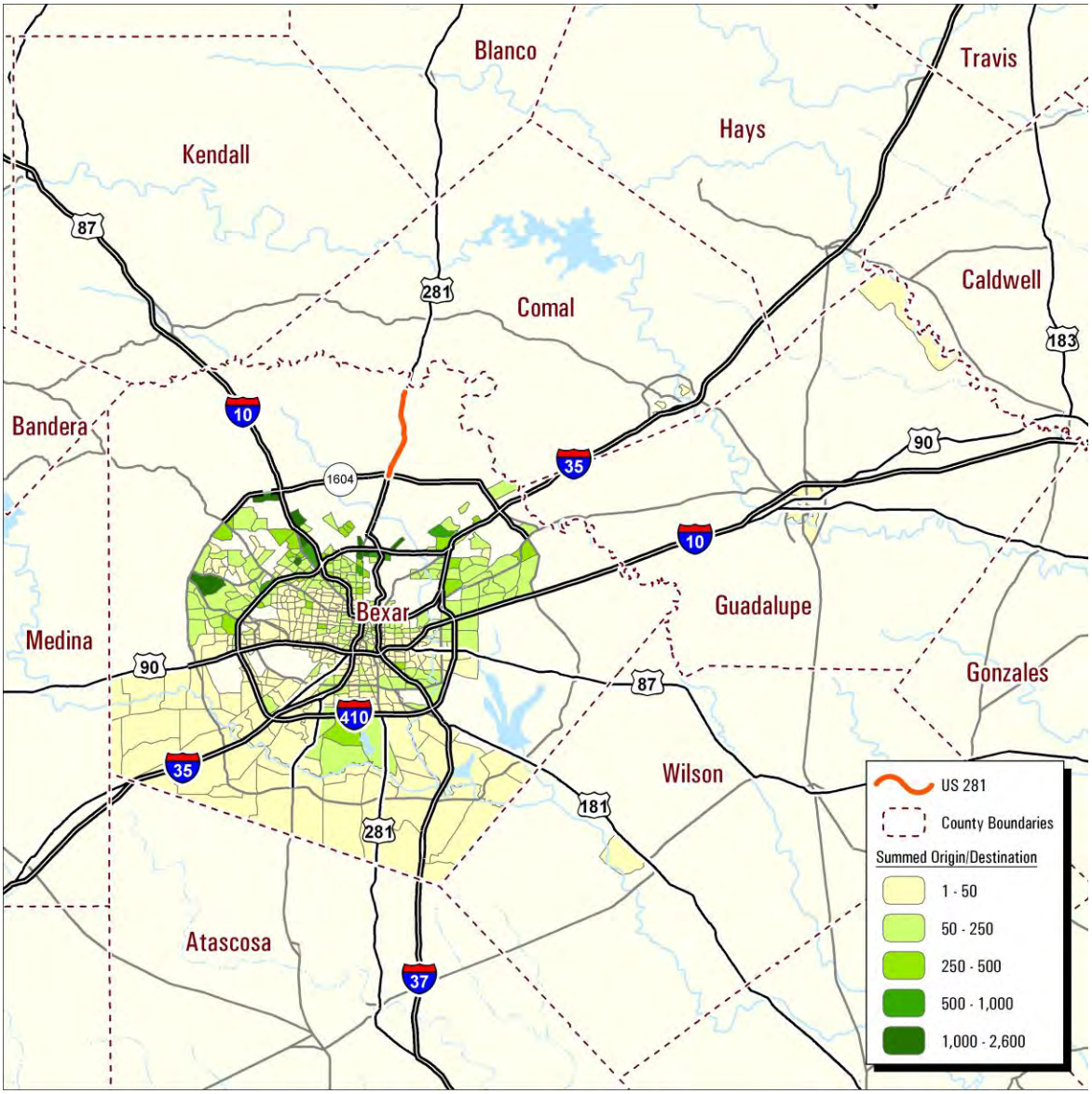
- 2035 No-Build
- 2035 General Purpose Expressway Alternative
- 2035 Tolled Expressway Alternative – Tolled Path
- 2035 Tolled Expressway Alternative – Free Path (Alternate Routes – using the Toll Alternative but excluding paths that utilize the US 281 corridor)

The No-Build and Tolled Expressway Alternatives were analyzed with three toll pricing scenarios. According to the *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System*, potential toll prices. could range between $0.17 and $0.50 per mile for the region. Therefore, the analyses were performed with $0.17, $0.32, and $0.50 per mile prices to provide a range of estimated benefits.

## 1.2 RESULTS SUMMARY

Out of 9.2 million daily trips in 2035 made in the five county region modeled by the MPO, approximately 211,000 are projected to use US 281. These are considered the candidate trips, and 75,000 of them are projected to either begin or end in an Environmental Justice zone. **Figure E-3** presents the Environmental Justice zones with trips that use US 281 and the number of trips that begin or end in each zone.

Figure E-3: Environmental Justice Zones that use US 281




Source: US 281 EIS Team, 2011

### 1.2.1 Travel Time Analysis

The corridor is in the northern reaches of the San Antonio region, so trips that use the corridor are generally longer than average for the region, because services and employment opportunities are further away. The average trip distance for all trips in the region is approximately 9 miles, compared to approximately 22 miles for candidate trips. The average trip time in the No Build Alternative is 97 minutes for all candidate trips, and 106 minutes for Environmental Justice candidate trips. Both build alternatives result in improved travel times for all users, including Environmental Justice trips. **Table 1** through **Table 3** below summarizes the changes in travel times for the analysis year of 2035 for the General Purpose Expressway Alternative and each of the three Tolled Expressway price scenarios. Note that trips that are not identified as candidate trips are slightly impacted (positively) by the inclusion of either build alternative. These are trips that use other roadways in the area that are relieved by the US 281 improvements.

The results demonstrate that an overall decrease in travel time is experienced by travelers in 2035 from Environmental Justice zones, compared to the scenario of not implementing the project (No-Build). Travelers from Environmental Justice zones would realize travel time benefits that are similar in magnitude to the travel time benefits of all users. The findings of this analysis are consistent with the findings of the *SA-BC MPO Regional Toll and Managed Lane Analysis* (July 26, 2010).

In addition, because every toll alternative would include frontage roads adjacent to the mainlines, the free alternate routes would not result in any greater distance traveled.

**Table 1: Environmental Justice Analysis – Expressway Alternative – Non-toll**

| | Candidate Trips | | All Other Trips | |
|---|---|---|---|---|
| | All | EJ Trips | All | EJ Trips |
| Number of Trips in 2035 | 211,200 | 75,400 | 8,995,100 | 5,871,700 |
| No-Build Alternative | | | | |
| Average Time | 97 | 106 | 28 | 26 |
| Expressway Alternative - Non-toll - Path | | | | |
| Average Time | 83 | 90 | 28 | 26 |
| Time Savings per Trip compared to No Build (minutes) | 14 | 16 | 0 | 0 |
| Total Time Savings compared to No Build (hours) | 50,000 | 19,500 | 28,000 | 7,000 |

Source: US 281 EIS Team, 2012

As shown above, the Expressway Alternative – Non-toll would result in travel time savings of approximately 14 minutes for all candidate trips and 16 minutes for Environmental Justice travelers in the corridor.

**Table 2: Environmental Justice Analysis – 17 Cent Toll**

| | Candidate Trips | | All Other Trips | |
|---|---|---|---|---|
| | All | EJ Trips | All | EJ Trips |
| Number of Trips in 2035 | 211,200 | 75,400 | 8,995,100 | 5,871,700 |
| No Build Alternative | | | | |
| Average Time | 97 | 106 | 28 | 26 |
| Tolled Expressway Alternative –Toll Path | | | | |
| Average Time | 83 | 91 | 28 | 26 |
| Time Savings per Trip compared to No Build (minutes) | 14 | 15 | 0 | 0 |
| Total Time Savings compared to No Build (hours) | 49,500 | 18,500 | 16,000 | 2,000 |
| Tolled Expressway Alternative –Toll Free Path | | | | |
| Average Time | 89 | 97 | 28 | 26 |
| Time Savings per Trip compared to No Build (minutes) | 8 | 9 | 0 | 0 |
| Total Time Savings compared to No Build (hours) | 29,000 | 10,500 | 14,000 | 1,500 |

Source: US 281 EIS Team, 2012

As shown above, the Expressway - Tolled with 17-cent pricing would result in travel time savings of approximately 14 minutes for all candidate trips. Travelers unwilling or unable to pay the toll would still receive travel time benefits of 8 to 9 minutes compared to the No-Action Alternative.

**Table 3: Environmental Justice Analysis – 32 Cent Toll**

| | Candidate Trips | | All Other Trips | |
|---|---|---|---|---|
| | All | EJ Trips | All | EJ Trips |
| Number of Trips in 2035 | 211,200 | 75,400 | 8,995,100 | 5,871,700 |
| No Build Alternative | | | | |
| Average Time | 97 | 106 | 28 | 26 |
| Tolled Expressway Alternative –Toll Path | | | | |
| Average Time | 82 | 90 | 28 | 26 |
| Time Savings per Trip compared to No Build (minutes) | 15 | 16 | 0 | 0 |
| Total Time Savings compared to No Build (hours) | 52,500 | 19,000 | 11,500 | 500 |
| Tolled Expressway Alternative –Toll Free Path | | | | |
| Average Time | 90 | 99 | 28 | 26 |
| Time Savings per Trip compared to No Build (minutes) | 7 | 7 | 0 | 0 |
| Total Time Savings compared to No Build (hours) | 23,500 | 8,000 | 8,000 | 0 |

Source: US 281 EIS Team, 2012

As shown above, the Tolled Expressway with 50-cent pricing would result in travel time savings of approximately 16 to 17 minutes for all candidate trips. Travelers unwilling or unable to pay the toll would still receive travel time benefits of 4 minutes compared to the No-Action Alternative.

These results are generally intuitive – as the price of the toll increases, fewer people will pay, which means that the tollway will be less congested, improving travel times for those using it. Meanwhile, travelers unwilling or unable to pay the toll will divert to other roadways, resulting in greater congestion and fewer travel time benefits for those

travelers. However, regardless of the pricing scenario, all travelers would benefit from improved travel times under the build alternatives, compared to No-Build.

### 1.2.2 Cost Analysis

The *Amended and Restated Policies and Procedures for Toll Collection Operations on the Alamo RMA Turnpike System* (April 2012) outlines tolling policies for the US 281 corridor and other proposed regional toll facilities. The updated policy proposes tolling prices ranging from $0.17 per mile to $0.50 per mile. The upper and lower values of this range, as well as a mid-range ($0.32 per mile) were analyzed. **Table 4** presents potential financial obligations under each of these tolling scenarios, based on median household incomes for families living within the region.

**Table 4: Toll Cost Summary**

| Toll Cost per mile | Daily Round Trip Cost | Yearly Cost | Percent of Median Household Income | | |
|---|---|---|---|---|---|
| | | | Bexar County ($45,315)[2] | Comal County ($62,642)[3] | Poverty Line ($18,136)[4] |
| $0.17 | $2.72 | $680 | 1.5% | 1.1% | 4.7% |
| $0.32 | $5.12 | $1,280 | 2.8% | 2.0% | 7.0% |
| $0.50 | $8.00 | $2,000 | 4.4% | 3.2% | 11.0% |

Source: US 281 EIS Team, 2012

While Environmental Justice populations may spend a greater portion of their income on tolls, as shown in **Section 1.1.4**, alternate (free) routes are available in the Tolled Expressway Alternative that provide improved travel times as compared to the No Build alternative, and would provide a net benefit to Environmental Justice and Non-Environmental Justice communities.

There were no low-income populations identified within the study corridor and because the project will enhance the overall functionality and mobility of the existing non-tolled transportation network, which includes the frontage road lanes, as well as any future transit service, it is anticipated that low-income travelers would not experience a disproportionately high and adverse human health and environmental effect as a result of either Build Alternative.

[2] *US Census Bureau*

[3] *US Census Bureau*

[4] *US Department of Health and Human Services 2012 Poverty Guidelines for as 3-person household, as adjusted to 2010 dollars using the Consumer Price Index.*

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